March 1981

PRODUCTION

. . . helping to answer th[illegible]tical challenges of manufacturing

Does America Deserve A Black Eye For Quality? p.79

Coated Abrasives: Fast Take Off . . . p.86

Machine Leasing Keeps Shop Up to Date . . . p.93

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PRODUCTION®

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It is the purpose of **PRODUCTION** to recognize and to fulfill the special needs of the managers and engineers who are responsible for improving manufacturing efficiency, costs and quality in production metalworking plants, and selected supplier industries.

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Does America Deserve a Black Eye for Quality?
In Part I of a two-part series, the status of America's product quality as seen by samples of PRODUCTION's readers and the public at large is investigated.

Abrasive Belt Machining—Fast Take Off
High metal removal rates with high machine uptime are important benefits of the advances in this process' systems and technology.

Job Shop's Growth Formula
Nineteen leased CNC machines, plus high-quality performance, plus motivated people are the basis of the solid growth being registered by Wyndham Industries, Inc.

With Faucets, It's What's Underneath That Counts
Polishing and buffing operations got high priority when Masco Corp.'s Delta Faucet Div. equipped a new plant. Several new Acme machines do the job.

Mercury Marine Boosts NDT Production 50%
Two specially designed Magnaflux magnetic particle inspection units provide efficiency gains in checking for defects in crankshafts and propeller shafts.

Shift to Welded Tubing Cuts Steel Cost 15%
By switching from seamless to drawn-over-mandrel steel tubing, Jameson Corp. has lowered manufacturing costs from those of four years ago.

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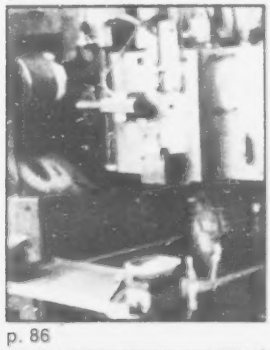

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Cover: This familiar face takes some beatings on quality.

Next Month: New cutting tool geometries.

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Quality — Part 1

Does America Deserve A Black Eye for Quality?

A sure-fire way to start a lively argument is to make a flat statement about the quality of American products. It doesn't matter which position you take—you can hold either that they're lousy or totally superior; you'll find a goodly number of people with the opposite viewpoint, and with strong evidence for their opinion.

America's manufacturing industries are being seriously challenged from abroad and product quality has become a major battleground. At stake, in the view of many manufacturing people, is nothing less than survival.

Attesting to the importance PRODUCTION's readers attach to the subject was the immediate and extremely high response to a confidential questionnaire that reached the desks of 1300 randomly selected readers during the Christmas/New Year holidays. Our mailbags literally bulged with their prompt replies.

The candor that was expressed and the comments they added seem to signify the depth of feeling about the importance of the subject of quality and their desire to wave storm warning flags. For example, 80 percent of the respondents admitted that their companies have shipped products of sub-standard quality; in many cases, they said, this was done at the express direction of a company executive.

There are many surprises, both pleasant and unpleasant, in this survey.

- One is that American quality is probably better than it is often perceived to be.
- Another is that America's production workers do "give a damn."
- A third one is that companies currently hurting for sales nevertheless are letting poor quality products reach their customers.
- A fourth is that efforts at quality improvement are being made but there appears to be considerably less than a maximum corporate commitment to that objective.

If we had to fill out a report card on American product quality, we'd be hard-put to grade it more than "B-"—well above "passing" but certainly nothing to brag about.

Uncle Sam doesn't deserve his black eye. But he's far from being in fighting trim if he's expecting to do battle with some heavyweights.

In this two-part series, we'll look first at the quality situation as it is seen to exist by observers and by people on the actual firing line. Next month, we'll report on the constructive actions now being taken by numerous members of American industry.

The situation permits no complacency; the warnings are clear. But so, thankfully, are the solutions.

[continued]

A recent survey by the American Society for Quality Control of 10,000 American households showed overwhelmingly (72.6%) that the American public considers American industry to be more concerned with profits than it is with product quality.

A survey by PRODUCTION of 1300 picked-at-random readers shows just as clearly that expediency takes precedence over quality in many American plants.

Poor quality products are going off the shipping docks of American companies: our readers are seeing it happen. And in some cases being told to make it happen.

Also, at their receiving docks, respondents almost universally report poor quality of incoming materials and equipment.

P.T. Barnum said: "There's a sucker born every minute!" An anonymous sales genius said: "The customer's always right!"

Today, in many instances, the customer finds he or she is not right. But they're not about to be dubbed as suckers. The so-called "fickle" customer may be showing instead that he's finicky (see Losers and Winners below).

As crucial to our industry's survival as its ability to operate more productively is its ability—and commitment—to make products of higher quality.

The domestic automotive industry realizes this more clearly than any other, because it has had the lesson brought home to it more painfully.

No industry, however, is immune to the danger nor so superior as to be able to risk letting down its guard.

We know our readers have a better understanding of what quality is than the public at large. And we consider these readers more sophisticated and critical. The comparison of ASQC's survey results and PRODUCTION's regarding the relative perceived quality of American products and imported products, therefore, adds credence to the importance of the danger.

Three quarters (75.7%) of the public feel that the quality of foreign products is better than (27.4%) or the same as (48.3%) that of American products. Eighty-eight percent of the respondents to PRODUCTION's survey rank foreign **consumer** products better in quality than (25.3%) or equal to (62.7%) domestic products.

Industrial products of American origin, however, fare much better in the experience of our readers. Sixty-five percent of our respondents rank quality of the foreign output equal to (47.0%) or better (18.1%). The American industrial products are rated superior by 34.9 percent.

Our readers have a very different view than ASQC's sample of what's been happening to American quality and where it's going in the future.

In ASQC's survey, almost half of the public (49.9%) feel that product quality has dropped during the past five years. A fourth (24.8%) believe it has remained the same, and a fourth (25.3%) see an improvement.

The public's majority expectation is that product quality in the next five years will stay at today's lower level (35.7%) or will decline further (23.6%). The group looking for improvement (40.6%) is, significantly, composed largely of persons over 50. The segment of the population that is most negative as far as quality improvement is concerned is the age group of 25-to-49-year-olds—the major buying group. The attitude about future American product quality becomes more negative as education level and income level increase.

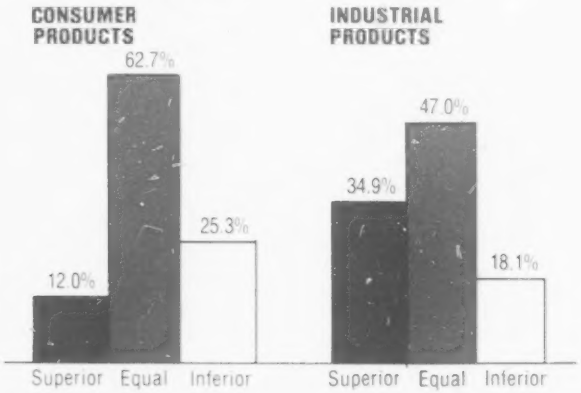
In contrast, a majority of PRODUCTION's reader sample (55.1%) says the quality trend has been better in the last five years. Only 17.3 percent say it has deteriorated.

The PRODUCTION sample is much more sanguine than the public at large about the future: 80.2 percent expect the quality trend in the next two years to improve; only 5.9 percent look for a decline and 13.8 percent expect it to remain the same.

This group sees and in many cases is directly involved in the concrete actions for improvement being taken by their companies. More than a few of them express the conviction that the quality trend has to improve.

Real or Phony? If American quality actually has improved and is going to get even better, the tone of this

How Do American Products Compare with Foreign Products?



article should be more optimistic than it is.

However, the response we got to a question about quality philosophy in our readers' companies is sobering.

Our question was: "Most companies have a stated philosophy about quality. In companies where you have worked, is this a sincere objective backed up by adequate personnel, equipment, training, rewards/punishments? Or is it mostly 'lip service'?"

The percentage replying "lip service" was 43.5. Their write-in comments about the adequacy of personnel, training, rewards/punishments were often caustic.

Among that small majority (56.5%) who said quality is a sincere objective in their companies there were also many emphatic comments added.

There seems to be nothing "gray" about a company's attitude on quality. They either are getting production to their quality standards, no ifs, ands, or buts, or they're proving by their laxness and low priority to it that it isn't very important.

Conventional wisdom says that this latter condition is the fault of the workers—their purported "don't give a damn" attitude. Reflecting this, only 35 percent of the public, as shown in the ASQC survey, feel that American workers are concerned about the quality of the products they make or the services they render.

Our survey shows, however, that the quality problem isn't a worker problem, at least not very often.

Our readers were asked to characterize "the average production worker at your company with respect to workmanship."

More than twice as many respondents (11.6%) said this worker "is highly quality-conscious and takes pride in good work" than said "doesn't give a damn" (5.5%).

A substantial majority (60.0%) said this worker "is usually conscientious and 'tries to do it right.' "

The remaining 22.8 percent characterized the average worker as "produces well when watched but otherwise slacks off."

Expediency Rules. The message we get from these statistics is that in most cases a company's management dictates what quality performance its products will achieve. The workers get most of their signals from the top-level attitudes and actions they observe. Concern for quality is a contagious "disease."

It's been said that "companies get the unions they deserve." It certainly seems to be true that "they get

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Losers and Winners

To nobody's surprise, 36.5 percent of the people responding to an American Society for Quality Control 10,000-household survey on American product quality rated automobiles low. American vehicles, likewise, were the clear-cut choice among PRODUCTION's surveyed readers who had bought for personal use in the last two years a mechanical product whose quality, in their judgment, was "lousy." Cars, trucks and vans captured 30.6 percent of their "yes" votes.

Household appliances took second billing, at 15.3 percent of mentions for "lousy" quality in our survey, while portable power tools ranked third at 5.5 percent.

However, less than half of PRODUCTION'S survey respondents (49.7%) have been stung by a poor quality consumer product. A slim majority (50.3%) has had no unpleasant personal purchase experience in the past two years.

In the other direction on the quality scale, the ASQC survey has 39.1 percent of the public ranking the quality of appliances high, toys at 32.5 percent, and autos getting a high score from 17.6 percent. Drugs and pharmaceuticals were rated high or very high in ASQC's survey by 67.3 percent of the public. Frozen foods came in for a 58.1 percent high or very high mark and television sets were ranked high in quality by 50 percent of the survey responders.

While American industrial equipment was ranked superior to that made abroad by 34.9 percent of PRODUCTION's survey respondents compared with the 18.1 percent who ranked it inferior, the quality of raw and semifinished materials bought for use in production operations came in for heavy criticism.

Steel, castings and molded plastic parts were the most frequently mentioned items in part 2 of our survey's question: "Has your company had quality problems in the past year with purchased equipment, materials, supplies, etc.? What product(s)?"

An overwhelming 74 percent of the respondents said "yes" to this question before enumerating the faulty items and indicating in most cases that these had failed to meet specifications.

Not infrequently, the write-in answer for the subsequent question on "What remedial action was taken?" was: "We changed sources," or, often in the case of plastic items, "We're now making them ourself."

In a year of slow demand, what, if anything, were those experiences telling the responsible suppliers? □

Companies' Dedication to Quality — Is It Sincere or 'Window Dressing'?

the quality they deserve."

This view is reinforced by the comments made in answer to our two-part question: "Do you think a product of sub-standard quality has ever left your company's shipping dock? If you answered 'yes,' why do you think this happened?"

Eighty percent of our respondents said "yes." The primary reasons written in were "end-of-month crunch," "to meet shipping schedule," and "order from Sales to ship." Far less prevalent were such explanations as "oversight," "inadvertent error," "inadequate final inspection personnel," "we use statistical product checks."

The public's belief as shown in the ASQC results that American industry is more interested in profits than quality gets some limited support from PRODUCTION's survey, although our study singled out cost reduction rather than profit generation for research.

We asked: "In your organization, how does quality improvement rank as an objective compared with cost reduction?"

Encouragingly, almost half of the respondents (46.7%) said there is "strong emphasis on both."

Not surprisingly in the closing month of depressed 1980, 35.0 percent of our sample said there is "more emphasis on cost reduction." Almost half as large a segment (18.2%) indicated there is "more emphasis on quality improvement."

We pursued the cost reduction issue vis a vis the quality improvement issue further, asking those readers who said cost reduction currently is receiving more emphasis whether in the past quality had ever taken precedence.

"Yes," said 68.1 percent of them. This had happened, they explained, because of "a product 'disaster' " (39.3%), "an executive's edict" (33.9%), or "a competitor's advantage" (26.8%).

Not an 'Either, Or' Choice. It is worth emphasizing, as several of our readers did and as ASQC President Jay W. Leek does in his "Quality Improvement Manifesto" (below), that the objectives of cost reduction and quality improvement are not mutually exclusive.

Improvement of quality, rather than being a source of expense, can be an important contributor to cost

A Quality Improvement Manifesto

by
Jay W. Leek
President, American Society for Quality Control*

For years, American business and industry has been fighting the effects of inflation, increasing foreign competition, consumer attitudes, government and a host of other perceived adversaries. Unfortunately, most observers agree that we have lost more of those battles than we have won. The net effect of those losses has accumulated over the years to the point where it now appears that the United States is in the first stage of a crucial battle that may well determine if this country will emerge from the 1980s as the dominant economic power in the Western World.

If that seems like another doomsday prediction or a serious overstatement of the actual situation, consider the impact of foreign competition in both domestic and foreign markets.

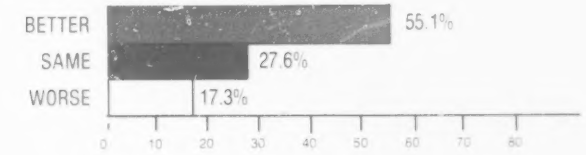
As our experience with the American automobile industry clearly shows, whether or not we win the battle depends on holding the confidence of the American consumer. And here is where we are in the greatest jeopardy.

We are caught up in an entirely new attitude toward buying goods and services that was born in the consumer movement and fed by inflation and today's uncertain economy. Consumers now demand goods and services which do what they are supposed to do the first time, every time.

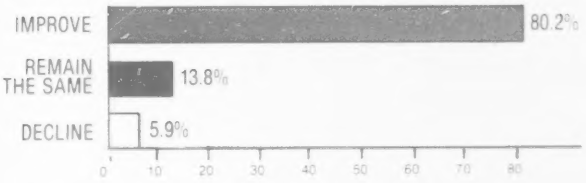
*Mr. Leek also is affiliated with The Quality College, Inc., Winter Park, FL

What Direction Is Quality Going?

Quality Trend in Last Five Years:



Quality Trend in Next Two Years:



reduction. Leek says the cost of poor quality is, on the average, 10 to 15 percent of a company's sales dollar.

It might be revealing to those companies where defective products have knowingly been shipped under the edict of "ship it now, fix it later" if they were to analyze a make-it-right-the-first-time cost against the worth of the on-time delivery and the subsequent repair cost and customer's ill-will.

The public, however, has come to believe that product price and product quality are closely linked. Half of ASQC's survey respondents (49.7%) agree that in today's economy making a high-quality product just simply costs too much. Women, in general, feel this way more than men. But as income and educational levels increase in ASQC's sample, the alibi about the high cost of quality for today's economy becomes less accepted.

The Solution Isn't Just P.R. The American Society for Quality Control is in the process of launching a multi-faceted campaign that has as one of its objectives to improve the public's perception of the quality of American products.

It will be asking companies to help convey the quality message to their publics.

It also is seeking a national commitment to the improvement of quality.

These commendable efforts must not be allowed to have a hollow ring. What counts in the long pull is an actual improvement in quality—the kind of turnaround the Japanese were able to accomplish in the

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In short, consumers want quality and they are willing to pay more for goods and services they feel confident will deliver that quality. Planned obsolescence is obsolete.

Sensing that this attitude was developing, the American Society for Quality Control commissioned the first and most comprehensive study of American consumer attitudes toward quality.

The results show that nearly half the population feels that American product quality has declined over the past five years, and, more important, more people—nearly 60 percent—feel that product quality will stay at that same low level or continue to decline over the next five years.

The vast majority, and particularly the better paid, better educated, sent a clear message. They have lost confidence in the ability of American manufacturers to provide superior products.

We do not believe that this is the case. We know that the overall quality of American products is superior to any country in the world. But whether what people believe is accurate or not is almost beside the point. People act on what they believe to be true and their perception is that American suppliers are delivering second rate goods and services.

And here is where perception and reality come together. The American people are not sure what part labor and the economy play in declining quality, but they have no doubts about the responsibility of business and industry. In one of its most telling findings, the study shows that nearly 75 percent of the American public emphatically feels that U.S. industry is more concerned with profits than it is with quality.

We know that one response to increasing costs over the past 10 to 20 years has been to shave quality in favor of short-term profits. We have let our plants and equipment become outdated, substituted materials that were *almost* as good as the original materials, and clung to the assumption that the sheer weight of the American industrial machine could overcome any competition.

That may have been true in the first half of the century when we were the industrial capital of the world and the predominant source of its growing demand for goods and services. But the emergence of

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1950s when a national policy toward improvement of quality as a means of winning export markets was broadly and successfully implemented.

Nature of the Efforts. We at PRODUCTION can report that the process of quality improvement is well under way in many of the companies we've contacted.

The re-dedication of the automotive industry to quality is perhaps the most notable example. We'll report more fully on it next month. And nearly every company we've contacted in other industries is extremely conscious of the need to expand their quality assurance efforts and most have embarked, in a variety of ways, on that path.

In our survey, only 7.8 percent of the respondents said their companies are not taking any kind of quality improvement measures. A few of these, however, indicated that some actions are being considered.

Suggesting that the actions in the vast majority of companies are not either superficial nor minimal is the current emphasis on product design changes.

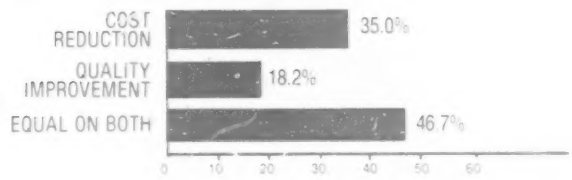
Our respondents were asked to identify which of the following quality improvement actions their companies are taking: Product design changes; new gaging inspection equipment; new production equipment; employee training motivation programs; other.

In this listing, product design changes lead (71.1%). Employee training motivation programs are close behind in mentions at 70.0 percent.

New gaging inspection equipment has been or is being installed by 64.8 percent of the companies that are taking quality improvement actions, and 62.7 percent of such companies report they are adding production equipment with better quality capability.

Structural changes in the organization responsible for quality assurance quality control were pointed out by several of our respondents. These range from having Quality Assurance now report directly to the president to moving the quality responsibility largely to the production workers. In this connection, Quality Circles are reportedly in use or being instituted at 28.4 percent of the respondent companies.

Where's the Strongest Emphasis?



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highly skilled managers overseas with modern plants and equipment dramatically changed our position.

In short, we drastically overestimated the willingness of the American people to buy anything we put on the market while we underestimated the competitive forces that were developing overseas.

We are now paying the price.

So what do we do about it?

- **First, we have to recognize that we have a critical problem.** That may seem obvious, but there are still too many of us who try to explain away the situation by pointing fingers at the economy, labor, government, and other "factors," rather than recognizing that the solutions start with us, not them.
- **Second, "Us" starts with the chief executive officer and top management being involved in assessing what poor quality practices are actually costing their organizations.** Too few members of top management recognize that poor quality may well be costing them an average of 10 to 15 percent—and as high as 20 percent—of their sales dollar.

A reduction in quality costs of only 1 percent in a one-hundred-million-dollar corporation would yield an additional $1 million in "found" money to use on capital equipment, personnel training, or to add to the profit side of a P&L statement.

- **Third, we have to recognize that older concepts of "quality control" are out of date.** A good deal has been learned about quality as a comprehensive management tool that can be employed at every step from design through assessing how well goods and services stand up to buyers' demands.

In fact, experience has shown that the kind of improvements we have been talking about can only result through introduction of comprehensive quality management directly supported by a chief executive officer.

- **Fourth, we need to limit the traditional adversarial relationships that have existed between business, labor, government and consumers.** Labor and management in the American automobile industry, for example, are evolving new relationships to meet their common need to produce higher quality automobiles capable of competing with the Japanese. Other industries have experimented with ways to involve workers in the production of goods and services and have found as much as a six-to-one return on their investment.

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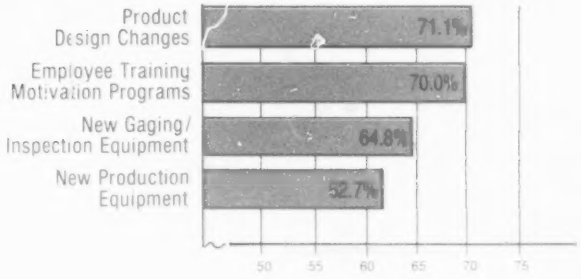
What Quality Improvement Actions Are Companies Taking?



While a few people said their outgoing product inspection is being intensified, a far greater number said the emphasis now is on in-process audits—catching and correcting defects before the products are totally built. The preventive theme, of course, is heavily mentioned in connection with the current emphasis on new product design. Where personnel problems have been great, product design for process automation is sometimes seen as the basic solution.

In the category of "other" types of company actions being taken for quality improvement, the most significant ones pertain to top-to-bottom quality dedication. This was exemplified by this comment from a manufacturing engineer at a home appliance company: "Our name means quality. The attitude in the plant is that the company would rather go under than cheapen its product."

Obviously, the respondents who indicated that this or a variation of it is the prevailing posture at their organizations are not among the 43.5 percent who said they see more "lip service" to quality than dedication to it.

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The future reputation and acceptance of our products in domestic and international marketplaces will importantly hinge upon whether this two-fifths plus of the American companies represented in PRODUCTION's survey sample change their quality philosophy.

We'll give them models to follow next month. *Howard C. Tuttle*

• **Fifth, organizations need to communicate their quality efforts to their own publics.** While in no way minimizing our quality problems, we do a better job of producing goods and services than is generally recognized. Part of the problem is that the situation is seen as being worse than it actually is. Realistic communication of an organization's quality efforts will help to bring public perception and reality closer together.

• **Sixth, government can assist our national effort by changing such things as depreciation schedules, investment tax credits, new incentives for personal savings, and by recognizing that industry members need the latitude to develop joint activities without automatically falling prey to anti-trust actions.** We need to strike a new, supportive relationship between government and business to counter the support other governments provide their manufacturers.

• **Seventh, labor organizations need to actively promote a sense of pride and craftsmanship in their members and be willing to take part in mutual management-labor efforts to improve quality and productivity.** Both parties have a fundamental stake in assuring that American organizations remain in business.

• **Eighth, and not last, we need to develop a common understanding of what "quality" means.** It means conformance to standards, not glitter and gloss. In that sense, the difference between a Volkswagen and a Cadillac is luxury, not quality. The quality of the two cars—their performance for value paid—should be the same. They both should conform to the standards set for them. We need to educate both people in business and the general public to what quality means.

The American Society for Quality Control has recognized the need for leadership and coordination in the development of a national commitment to quality in this country.

Over the past 35 years, the 37,000 members of ASQC have learned a good deal about quality and the management of quality in business and industry. We are now making a concerted effort to make that information available and to extend the Society's educational efforts.

For our part, the American Society for Quality Control is committed to making sure that the competitive battle of the 1980s is resolved in this country's favor. □

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